

Application No. 10/553,689
Amendment Dated: July 9, 2008
Reply to the Final Office Action of May 29, 2008

REMARKS

Applicants respectfully request that the application be reconsidered in light of the following remarks.

Claims 1-21 are pending.

Claim Rejections Under 35 USC §103 (a)

Claims 1-21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,290,745 to Jorgensen *et al.* ("Jorgensen-745") in view of U.S. Patent No. 6,617,405 to Jorgensen ("Jorgensen-405"). Applicants respectfully disagree.

Applicants recite *inter-alia* a gas phase olefin polymerization process comprising the step of partially pre-activating the catalyst precursor by contacting the recited slurry with one or more Lewis Acids employing one or more in-line static mixers, wherein the molar ratio of the Lewis Acid to the electron donor in the catalyst precursor is about 0.1:1 to about 0.3:1; and transferring the partially pre-activated catalyst precursor under plug-flow conditions into a gas phase, olefin polymerization reactor and adding an additional amount of the activator to the reactor to produce a homogeneous activated catalyst mixture, wherein the catalyst is partially pre-activated for a short residence time to minimize deactivation of the catalyst of about 1 minute to about 6 hours prior to the transferring step.

The Action states that Jorgensen-745 fails to disclose or suggest partial activation of the catalyst precursor, and that Jorgensen-745 is cited for its teaching of conducting the catalyst precursor using in-line static mixers. The Action thus relies on the combination of Jorgensen-745 with Jorgensen-405 in the finding of obviousness.

In contrast, Jorgensen-405 discloses a process wherein the essentially complete activation of the precursor is carried out prior to introduction of the precursor into the reactor, which is in contrast to Applicants' recited step wherein the molar ratio of the Lewis Acid to the electron donor in the catalyst precursor is about 0.1:1 to about 0.3:1.

Jorgensen-405 fails to cure the defects in Jorgensen-745. In Examples 1-4, Jorgensen-405 discloses a catalyst precursor preactivated using about 0.2 mole of a first activator and 0.45

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moles of a second activator for a total of 0.65 moles activator per mole of electron donor (see Col. 12, lines 1-13, Jorgensen-405.), Jorgensen-405 is thus outside of Applicants recited range of 0.1:1 to 0.3:1.

Jorgensen-405 further discloses "[a]dditional activator is fed to provide for sufficient activation of the catalyst plus a small additional amount to scavenge impurities in the polymerization reactor. The total amount of the additional "topping off" activator can be about 0.1 to about 75 percent by mol of the total amount of the activator used for the activation of the precursor. Addition of all the activator to the catalyst precursor eliminates mass transfer problems, which would prevent the activator from reaching the catalyst precursor if separate addition to the reactor was practiced" (see Col. 7, lines 17 to 26.)

Accordingly, Jorgensen-405 is directed to essentially complete activation followed by topping off of the reactor to ensure complete activation. This is in direct contrast to Applicants' presently claimed invention, wherein the catalyst precursor is only partially activated to between 0.1 to 0.3 moles of activator to electron donor prior to introduction into the reactor, and then fully activated in the reactor with the addition of between 2 moles to 50 moles of activator added per mole of electron donor, which is exactly the converse of the teachings of Jorgensen-405. As such, Jorgensen-405 actually teaches away from Applicants' presently claimed invention.

Applicants presently claimed invention thus differs from the cited prior art in that Applicants' recite a catalyst that is only partially activated with the Lewis Acid at a molar ratio of the Lewis Acid to the electron donor in the catalyst precursor of about 0.1:1 to about 0.3:1. Applicants show that this novel and non-obvious partial pre-activation, which is in conflict with the cited prior art, results in the unexpected benefit of a lowering of fines in the final product. Accordingly, Applicants' presently claimed invention is not rendered obvious by Jorgensen-745 in combination with Jorgensen-405. Removal of the rejection is respectfully requested.

Claim Rejections Under 35 USC §102 (b)

Claims 1-5, 8-18, and 21 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,187,866 to Jorgensen *et al.* ("Jorgensen-866"). Claims 6, 7, 19, and 20 are

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likewise rejected under 35 U.S.C. §103(a) as being unpatentable over Jorgensen-866 for the same rationale as cited in the rejections under 35 U.S.C. §103(a) as being unpatentable over Jorgensen-745 in view of Jorgensen-405. Applicants respectfully traverse these rejections.

Jorgensen-866 is generally directed to a process for the in situ blending of polymers comprising contacting ethylene and one or more comonomers in two or more fluidized bed reactors with a catalyst system comprising (i) a magnesium/titanium based precursor containing an electron donor and (ii) a hydrocarbyl aluminum cocatalyst, the improvement comprising (A) increasing or decreasing the melt flow ratio and/or molecular weight of the blend by, respectively, decreasing or increasing the mole ratio of a precursor activator compound to the electron donor or (B) increasing or decreasing the bulk density of the blend by, respectively, increasing or decreasing the mole ratio of a precursor activator compound to the electron donor, both (A) and (B) subject to defined provisos including partial pre-activation of the precursor.

The Action notes that the rejection is based on Table III of Col. 15 for Example 5 of Jorgensen-866. Example 5 discloses a two reactor system, wherein the partially activated precursors are utilized in a first reactor and then the reaction mixture is transferred into the second reactor wherein the catalyst is fully activated (See Col. 13, line 45-49 for a description of the Examples.) Example 5 discloses two reactors along with data for those two reactors. Jorgensen-866 fails to disclose or suggest Applicants' recited step of partially pre-activating the catalyst precursor by contacting the slurry with one or more Lewis Acids employing one or more in-line static mixers, and transferring the partially pre-activated catalyst precursor under plug-flow conditions into a gas phase, olefin polymerization reactor and adding an additional amount of the activator to the reactor to produce a homogeneous activated catalyst mixture. Instead, the partially activated catalyst is reacted under polymerization conditions with the monomers in a first reactor, and then transferred into a second reactor wherein the catalyst is fully activated. Since Jorgensen-866 fails to disclose or suggest all of Applicants' recited limitations, Jorgensen-866 cannot be found to anticipate nor obviate Applicants' presently claimed invention.

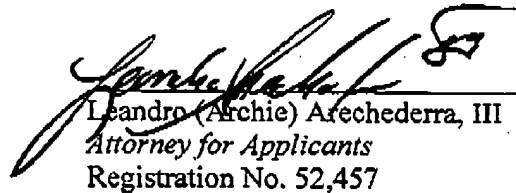
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Applicants respectfully request that all rejections be withdrawn and solicit a prompt notice of allowability. In the alternative, Applicants invite the Office to telephone the undersigned attorney if there are any other issues outstanding which have not been presented to the Office's satisfaction.

Respectfully submitted,

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Date


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